AD115-8112

LF-1 POST-CLOSURE MONITORING THIRD QUARTER FINDINGS (SEPTEMBER 1998)

The site monitoring walkover continued to indicate that the landfill covers are in good condition overall. Maintenance requirements will be scheduled for repair in November 1998. These activities will be noted in the First Quarter Site Inspection to be conducted in March 1999.

The gas probe screening continued to show elevated levels of methane in the northeast corner of the Post-1970 Cell. Per the recommendations in the 1997 Final Annual Report, soil gas was screened at five (5) locations to determine the radial extent of gases emanating north and east of the Post-1970 Cell. Screening was conducted at depths approximately 10 and 20 feet below ground surface. A LandTec GEM 500 was used to screen soil gas for methane and a photoionization detector (PID) was used to screen for total volatile organic compounds. Results of the soil gas screening and a map with the locations are attached.

Settlement monitoring was conducted at the same locations surveyed in April 1997. According to the review of the survey data by the Jacobs surveying coordinator, there were no clear indications of settlement at any of the 23 points compared to the baseline study.

Attached are the following individual components of the monitoring inspection:

Attachment A - Site Monitoring Report
Attachment B - Gas Probe Screening Results
Attachment C – Settlement Survey Results
Attachment D – Soil Gas Results
Attachment E – Figures

ACRONYMS AND ABBREVIATIONS

J	estimated quantity
LEL	lower explosive limit
mg/L	milligrams per liter
ND	non-detect
NS	not sampled
OVA	organic vapor analyzer
PID	photoionization detector
PPBV	parts per billion by volume
R	rejected value
U	non-detected quantity above method detection limit
µg/L	micrograms per liter

ATTACHMENT A

SITE MONITORING REPORT

MASSACHUSETTS MILITARY RESERVATION
LANDFILL SITE MONITORING INSPECTION
AND CAP INSPECTION

Conducted by Darrin Smith and Mike Nestor
Inspection performed on October 1, 1998

Perimeter Fence

The perimeter fence is generally in very good condition. The front gate is still in need of adjustment. Minor damage to the fence is present at the intersection of Herbert Road and Frank Perkins Road. All of the gates work and were locked at the time of inspection. The stays designed to keep the gate open at GP 9 and GP 10 remain damaged.

Cell A - Post 1970 Cell

The cap on this cell is in excellent condition. The grass on the cap is dense and healthy. It was last mowed September 1998. No potentially intrusive vegetation is present. No appreciable subsidence was observed. Previous repairs to animal burrows appear to still be working, as no new holes were found.

Cell B - Kettle Hole Cell

The Cell B cap is in very good condition. In general the grass is dense and healthy with a few bare spots on top of the cap. The cap was last mowed September 1998. No potentially intrusive vegetation is present and no new erosion has taken place where repairs were made along the northern and southeastern edges. Grass has replaced areas of minor subsidence on the western side of the cell, near GVB-30. No animal burrows were noted, apart from mouse holes.

Cell C - 1970 Cell

The cap on Cell C is in excellent condition. The grass on the cap is dense, healthy, and was last cut September 1998. No potentially intrusive vegetation has begun to grow. Minor subsidence has occurred in the southern and eastern portion of the cell. Grass has been begun to grow on the eastern side of the cell where erosion repairs were made. Other than mouse holes, no animal burrows are present.

Gas Vents

All of the gas vents are in fine condition. They are a common location for mouse holes, but there is no apparent damage. All of the vent pipes are vertical.

Drainage Ditches

The drainage ditches are generally functioning according to design. Vegetation in the ditches is high and needs to be cut. No significant accumulation of sediment was noted.

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http://archive.org/details/lf1postclosuremo09unse

Along the northern end of the east edge of Cell C, a check dam remains partially washed out and the eastern side of the drainage ditch is slightly eroded. A second check dam just to the south shows signs of minor erosion.

All observed runoff water appears relatively clean.

Culverts

Organic debris no longer remains in any of the culverts. Water is flowing according to design. A small accumulation of sand is present in the effluent end of the culvert pipe leading from Cell A and Cell B into the Retention Basin.

Drainage Basins

The detention basin to the south of Cell C is in excellent condition and working properly. The retention basin to the east of Cell B also appears to be functioning properly. There is minor erosion at the bottom of the drainage ways.

Access Roads

The access roads are in very good conditions. The roads along the southwestern and northeastern corners of Cell C have been repaired.

Monitoring Wells

The well cap on 27MW0017A has been damaged and can not be locked. This will have to be replaced. Locks have been replaced on the remaining wells that require them.

Well ID	Lock Present	Properly Labeled
27RFW002A	YES	NO
27MW0015B	YES	YES
27MW0015A	YES	YES
27MW0015C	YES	YES
27MW0018B	YES	YES
27MW0018A	YES	YES
27MW0013A	YES	YES
27MW0013B	YES	YES
27MW0016C	YES	YES
27MW0016B	YES	YES
27MW0017A	NO	YES
27MW0017B	YES	YES
27MW0011C	YES	YES
27MW0020A	YES	YES
27MW0020B	YES	YES
27MW0010	YES	YES

Borrow Pit and Gravel Pit

Minimal vegetation has taken root in these areas.

ATTACHMENT B

GAS PROBE SCREENING RESULTS

Gas Probe Screening Results

	May-98					Jul-98					Sep-98				
Gas Probe Location	LEL (1)	CH_4 (2)	CO_2 (3)	O_2 (4)	PID (5)	LEL (1)	CH_4 (2)	CO_2 (3)	O_2 (4)	PID (5)	LEL (1)	CH_4 (2)	CO_2 (3)	O_2 (4)	PID (5)
GP-01 (10')	410	20.5	26.0	3.2	0	270	13.5	25.3	0.2	0.0	120	6.0	26.6	0.0	2.6
GP-01 (20')	472	23.6	28.9	2.8	0.0	382	19.1	27.1	0.1	0.0	336	16.8	33.3	0.0	0.0
GP-02 (10')	0	0.0	15.7	6.6	0.0	0	0.0	16.3	3.7	0.0	0	0.0	11.5	10.1	0.0
GP-02 (20')	458	22.9	31.4	2.4	0.0	356	17.8	29.5	0.1	0.0	342	17.1	36.9	0.0	0.0
GP-03 (10')	0	0.0	13.4	8.0	0.0	0	0.0	21.6	1.3	0.0	0	0.0	13.7	8.1	0.0
GP-03 (20')	372	18.6	32.7	1.5	0.0	392	19.6	32.7	0.2	0.0	357	17.8	41.0	0.0	0.0
GP-04 (10')	0	0.0	3.4	14.4	0.0	0	0.0	3.9	15.8	0.0	0	0.0	3.4	16.6	0.0
GP-04 (20')	0	0.0	13.7	5.1	0.0	0	0.0	15.5	4.0	0.0	0	0.0	15.9	4.7	0.0
GP-05 (10')	0	0.0	3.1	16.1	0.0	0	0.0	3.3	16.3	0.0	0	0.0	3.7	16.9	0.0
GP-05 (20')	0	0.0	6.5	12.6	0.0	0	0.0	6.9	11.9	0.0	0	0.0	8.0	11.0	0.0
GP-06 (10')	0	2.4	4.1	15.6	0.0	0	0.0	3.1	17.0	0.0	0	0.0	3.3	16.7	0.0
GP-06 (20')	0	4.1	2.4	17.3	0.0	0	0.0	4.0	15.8	0.0	0	0.0	4.4	15.7	0.0
GP-07 (10')	0	4.8	4.1	14.7	0.0	0	0.0	3.9	15.8	0.0	0	0.0	3.7	16.4	0.0
GP-07 (20')	0	2.0	4.8	14.0	0.0	0	0.0	4.3	15.0	0.0	0	0.0	4.3	15.7	0.0
GP-08 (10')	0	2.3	2.0	16.5	0.0	0	0.0	3.3	17.1	0.0	0	0.0	2.8	17.6	0.0
GP-08 (20')	0	2.2	2.3	15.0	0.0	0	0.0	2.7	15.7	0.0	0	0.0	2.8	16.6	0.0
GP-09 (10')	0	0.0	2.2	16.5	0.0	0	0.0	3.3	16.1	0.0	0	0.0	2.9	17.1	0.0
GP-09 (20')	0	0.0	4.8	13.0	0.0	0	0.0	5.4	12.8	0.0	0	0.0	4.9	13.2	0.0
GP-10 (10')	0	0.0	1.1	18.6	0.0	0	0.0	2.3	18.7	0.0	0	0.0	2.6	18.3	0.0
GP-10 (20')	0	0.0	1.2	18.9	0.0	0	0.0	1.8	19.0	0.0	0	0.0	1.8	18.9	0.0
GP-11 (10')	0	0.0	0.9	17.0	0.0	0	0.0	1.9	19.0	0.0	0	0.0	1.5	19.1	0.0
GP-11 (20')	0	0.0	0.8	16.7	0.0	0	0.0	1.2	19.4	0.0	0	0.0	1.3	19.3	0.0
GP-12 (10')	0	0.0	1.1	15.3	0.0	0	0.0	2.0	18.6	0.0	0	0.0	1.8	18.8	0.0
GP-12 (20')	0	0.0	2.3	13.9	0.0	0	0.0	2.7	17.0	0.0	0	0.0	3.0	17.1	0.0

Notes:

1) LEL - % Lower Explosive Limit.

2) CH_2 - % Methane.

3) CO_2 - % Carbon Dioxide.

4) O_2 - % Oxygen.

5) PID - Photoionization Detector (ppm).

ATTACHMENT C

SETTLEMENT SURVEY RESULTS

LF-1 Post-Closure Monitoring
Settlement Survey

	BASELINE DATA				ROUND 4 DATA				CHANGE FROM BASELINE		
GAS VENT	SURVEY DATE	BASELINE NORTHING	BASELINE EASTING	BASELINE ELEVATION (ft)	SURVEY DATE	ROUND 3 NORTHING	ROUND 3 EASTING	ROUND 3 ELEVATION	NORTHING CHANGE	EASTING CHANGE	ELEVATION CHANGE
GVC 1	4/29/97	245490.569	856978.677	130.27	9/17/98	245490.582	856978.563	130.29	-0.01	0.11	-0.02
GVC 3	4/29/97	245655.993	857055.757	135.91	9/17/98	245655.978	857055.706	135.92	0.01	0.05	-0.01
GVC 7	4/29/97	245930.849	857123.198	142.33	9/17/98	245930.809	857123.198	142.32	0.04	0.00	0.01
GVC 9	4/29/97	246033.899	857295.286	149.23	9/17/98	246033.837	857295.298	149.22	0.06	-0.01	0.01
GVC 11	4/29/97	246197.379	857371.344	153.55	9/17/98	246197.305	857371.371	153.54	0.07	-0.03	0.01
GVC 15	4/29/97	246316.841	857371.121	155.96	9/17/98	246316.781	857371.129	155.97	0.06	-0.01	-0.01
GVC 18	4/29/97	246424.482	857368.060	157.53	9/17/98	246424.421	857368.077	157.54	0.06	-0.02	-0.01
GVC 71	4/29/97	246491.535	857400.170	157.68	9/17/98	246491.481	857400.18	157.7	0.05	-0.01	-0.02
GVC 23	4/29/97	246639.428	857400.194	153.69	9/17/98	246639.373	857400.185	153.72	0.06	0.01	-0.03
GVC 28	4/29/97	246834.568	857444.262	147.57	9/17/98	246834.529	857444.257	147.6	0.04	0.01	-0.03
GVB 30	4/29/97	247082.030	857916.278	148.51	9/17/98	247082.008	857916.243	148.53	0.02	0.04	-0.02
GVB 33	4/29/97	247019.725	858106.725	159.98	9/17/98	247019.697	858106.726	159.98	0.03	0.00	0.00
GVB 38	4/29/97	246968.090	858261.475	168.30	9/17/98	246968.034	858261.489	168.27	0.06	-0.01	0.03
GVB 39	4/29/97	246956.246	858298.273	168.45	9/17/98	246956.263	858298.255	168.43	-0.02	0.02	0.02
GVB 42	4/29/97	246893.985	858487.273	165.48	9/17/98	246894.015	858487.262	165.51	-0.03	0.01	-0.03
GVB 45	4/29/97	246830.512	858678.047	158.61	9/17/98	246830.577	858678.035	158.64	-0.07	0.01	-0.03
GVB 47	4/29/97	246766.549	858867.417	148.00	9/17/98	246766.566	858867.415	148.03	-0.02	0.00	-0.03
GVA 52	4/29/97	247446.200	858882.920	151.44	9/17/98	247446.229	858882.889	151.44	-0.03	0.03	0.00
GVA 55	4/29/97	247331.329	859047.400	160.42	9/17/98	247331.39	859047.367	160.42	-0.06	0.03	0.00
GVA 58	4/29/97	247215.416	859211.486	167.59	9/17/98	247215.473	859211.461	167.57	-0.06	0.03	0.02
GVA 62	4/29/97	247148.934	859303.806	167.72	9/17/98	247148.982	859303.801	167.71	-0.05	0.01	0.01
GVA 63	4/29/97	247100.796	859373.968	165.70	9/17/98	247100.839	859373.97	165.7	-0.04	0.00	0.00
GVA 68	4/29/97	246983.814	859537.356	156.50	9/17/98	246983.888	859537.356	156.5	-0.07	0.00	0.00

ATTACHMENT D

SOIL VAPOR SURVEY RESULTS

Soil Vapor Survey Results

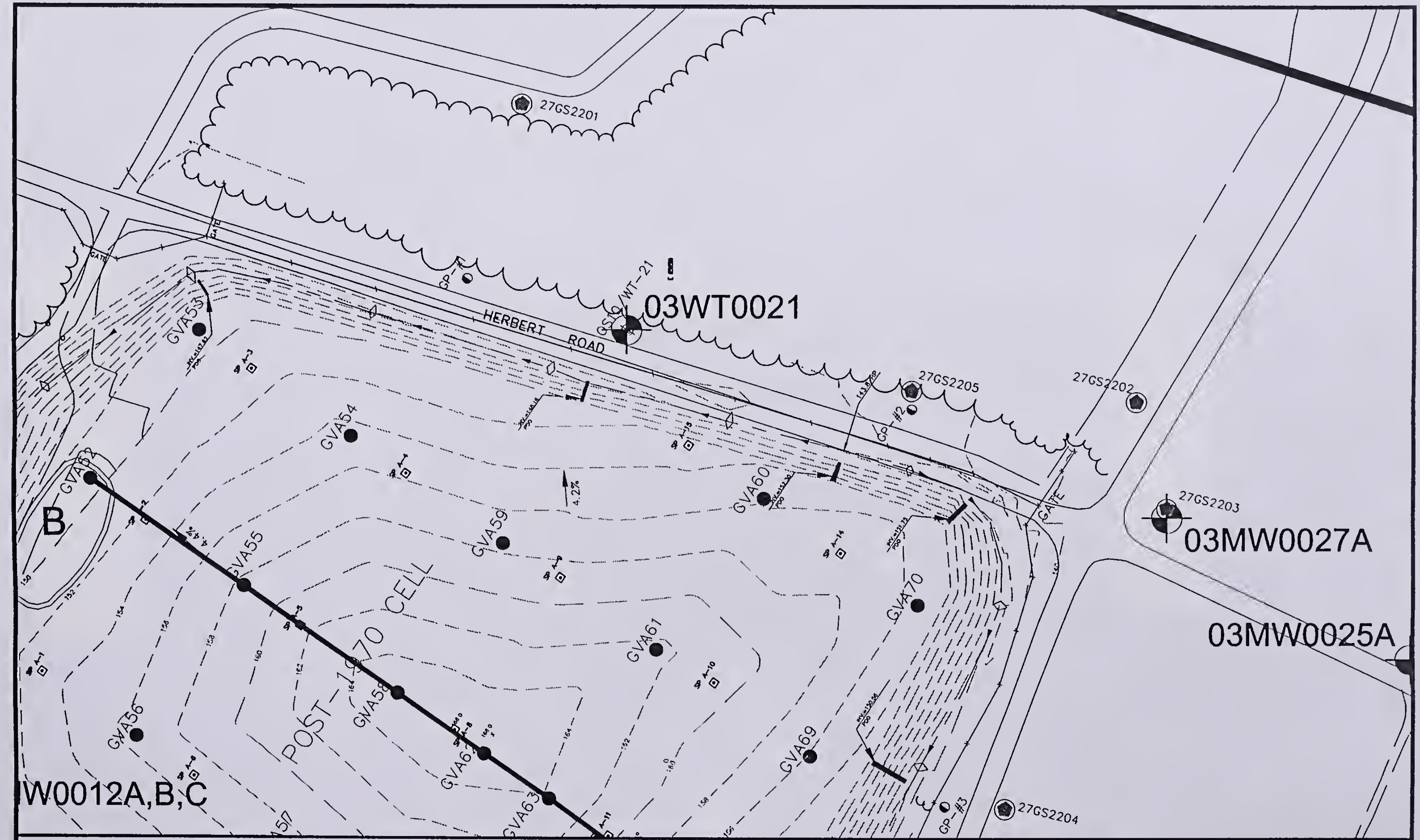
		SEP-98	
Probe Location	**Depth**	**CH_4**	**PID**
27GS2201	10	0.0	15.8
27GS2201	20	0.0	3.5
27GS2202	10	0.0	2.3
27GS2202	20	NS	NS
27GS2203	10	0.0	0.0
27GS2203	20	0.0	0.0
27GS2204	10	0.0	0.0
27GS2204	20	0.0	3.6
27GS2205	10	3.5	NS
27GS2205	20	0.0	NS

Notes:

1) Depth - feet below ground surface.
2) CH_4 -% Methane.
3) NS - not sampled.
4) PID - photoionization detector (ppm).

ATTACHMENT E

FIGURES



Legend

CULVERT PIPE
APPROXIMATE CULVERT PIPE
EXISTING DITCH CENTERLINE
EXISTING MONITORING WELL
SITE LOCATION
NEW GAS SAMPLING LOCATIONS

GAS VENT
EXISTING GRADE
SETTLEMENT SURVEY TRANSECT
STONE CHECK DAM
STONE RIPRAP
GAS PROBE
CHAIN-LINK FENCE
PERIMETER DRAINAGE OUTFALL
DELINIATOR POST

0 150
Scale In Feet

JE JACOBS ENGINEERING

LF-1
New Gas Sampling Locations

Massachusetts Military Reservation
Cape Cod, Massachusetts

10/15/98 mm File...LF1Plate.dwg | Figure

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